MARINE REGION

2014 YEAR IN REVIEW

Swells break over the offshore rocks north of Ten Mile Beach in northern California
CDFW photo by M. Patyten

A Message From Craig Shuman, Marine Region Manager

As stated in our mission, science and communication are the cornerstones of everything we do in the Marine Region. On any given day, Marine Region staff can be found along California's 1,100 mile coastline examining the ocean's flora and fauna both under water and in the lab, engaging stakeholders through public meetings and informal discussions, and out on the docks surveying and distributing the myriad of outreach materials we produce. This year, we prepared a special marine issue in the 100th volume of *California Fish and Game* that highlighted the cutting edge science performed by Marine Region staff. We also unveiled the new and improved *Marine Management News* newsletter as a blogsite (*cdfwmarine.wordpress.com*), promoted a partnership approach to managing our statewide network of marine protected areas, interviewed over 68,000 recreational angler parties, and submitted over thirty regulatory documents supporting state and federal management actions, to highlight just a few of our activities.

Marine Region Mission:
To protect, maintain, enhance, and restore California's marine ecosystems for their ecological values and their use and enjoyment by the public through good science and effective communication.

As you read through this document and tick off all of the Region's actions and accomplishments over the past year, you may come to realize (as I did) how amazingly diverse our charge has become. This diversity presents us with both challenges and opportunities as we tackle the science and the policy for the species we manage, navigate the assortment of stakeholder views we represent, and consider how to adapt our management structure in the face of a changing climate. It never fails to impress me how the approximately 140 full-time and 100 part-time Marine Region staff continue to rise to the occasion and embrace the diverse opportunities before us to conserve California's marine resources and protect our rich coastal heritage.

In 2014, Marine Region staff played an instrumental role in both state and federal marine policy, continued robust fisheries-dependent and fisheries-independent data collection efforts to support active resource management, upheld our public trustee stewardship responsibilities, and fostered effective partnerships. I offer my profound thanks to the Marine Region staff for their efforts over this past year, and I thank you, our ocean-focused constituents, for your commitment and dedication to the marine resources of California.

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About the Marine Region...

The Marine Region extends along the entire California coastline from border to border and approximately three nautical miles out to sea, including offshore islands. The five programs listed in the Table of Contents illlustrate the breadth and depth of Marine Region commitment to monitoring and protecting California's marine environment, and our commitment to providing each resident and visitor with the opportunity to use and enjoy California's marine resources.

2014 Region-Wide Accomplishments, By The Numbers...

Processed **391** Scientific Collecting Permit applications and issued **350** permits

Wrote, edited, and published **9** peer-reviewed articles in a special marine issue of CDFW's scientific journal, ***California Fish and Game***

Submitted **11** regulatory packages to the Fish and Game Commission for consideration

Contacted over **68,000** saltwater anglers. Observed and identified over **245,000** fish and invertebrates, and measured over **132,000** fish

Entered over **65,000** commercial landing receipts

Reviewed over **500** environmental documents, and submitted over **70** comment letters and permits

Distributed over **28,000** MPA guidebooks and **17,000** MPA brochures

Spent **2,600** hours attending Pacific Fishery Management Council meetings and submitted **20** reports on federal regulatory issues

In conjunction with partner agency staff, determined the age and origin of approximately **45,000** salmon taken in the sport and commercial fisheries

Reviewed and approved **159** aquaculture registration permits

1. State-Managed Marine Species Program

This program is responsible for fisheries managed by the State alone.

Abalone – In northern California, 110 transects (covering 6,600 square meters) were surveyed by scientific divers and over 2,000 red abalone were measured. At these same sites, 3,400 red sea urchins were also counted and 1,400 measured. At Van Damme State Beach, six of the 12 abalone recruitment modules installed over a decade ago were rebuilt and bolted to the sea floor. Staff and volunteers interviewed approximately 2,500 abalone divers and rock pickers along the northern California coast, and measured 5,700 red abalone during creel surveys.

In Southern California, 12 Baby Abalone Recruitment Traps (BARTs) were surveyed by scientific divers at Catalina Island, 12 at La Jolla, and 10 at Santa Cruz Island (Yellowbank), with one BART rebuilt at Yellowbanks. Staff installed 12 new BARTs at Palos Verdes. Nine transects were surveyed at three sites off San Nicolas Island, where staff measured 342 black abalone.

Staff began development of the Red Abalone Fishery Management Plan. The development process will build upon the Abalone Recovery and Management Plan's fishery management framework and goals. Staff conducted three public workshops and one tribal consultation to start the process.

In partnership with the California Ocean Science Trust, staff facilitated an independent technical review of CDFW red abalone survey design and methods.

Staff joined the NOAA Fisheries Black Abalone Recovery Team to participate in the development of a draft recovery plan for the endangered black abalone.

In collaboration with partners, staff participated in the successful spawning of endangered white abalone. This project has increased the numbers of white abalone held in captivity from less than 60 to more than 1,000 individuals.

Staff also collaborated with partners on planning and coordinating restoration efforts for green abalone. Staff issued two private stocking permits for pilot green abalone stocking studies, the first permits to be issued by the CDFW for abalone stocking in over 15 years. *Visit the Marine Region website at www.dfg.ca.gov/marine/invertebrate/abalone.asp for more information about abalone.*

Aquaculture – A proposed open-ocean aquaculture facility to be located in federal waters was reviewed by staff. Staff also assisted with identifying locations that would conflict with existing coastal pelagic fisheries and reviewed and provided comments to the Coastal Commission on the Mitigation Monitoring and Reporting Plan.

Staff processed, reviewed, and approved 36 Live Importation Permits, reviewed and approved 159 Aquaculture Registrations, prepared three Broodstock Collecting Permits and one Letter of Authorization, and reviewed and approved 10 Restricted Species Permits. Staff coordinated and completed an internal review of the Marine Aquaculture Programmatic Environmental Impact Report and participated on a CDFW team to finalize the document. *Visit the Marine Region website at www.dfg.ca.gov/marine/abmp/aquaculture.asp for more information about California marine aquaculture.*

California Halibut – Staff continued working on a collaborative study regarding the socioeconomics of the commercial California halibut fishery. Staff also continued to sample the commercial and recreational California halibut fisheries statewide for length, sex, and age information, an effort which began in 2007. The number of halibut aged using thin-sectioned otoliths passed the 2,000 mark this year. Staff completed all data collection and analysis

Diver locates an abalone recruitment module off Van Damme State Beach
photo by K. Joe

for a 2-year study on length and age at maturity, and fecundity for California halibut in central California— a first for this species. *Visit the Marine Region website at www.dfg.ca.gov/marine/sfmp/index.asp for more information about California halibut.*

Diving Safety Program – Staff led and maintained the CDFW dive program, which continued to provide initial certification and annual recertification of all CDFW divers, and maintain safety standards. This program enables over 75 CDFW divers to participate in subtidal research and monitoring activities. *Visit the Marine Region website at www.dfg.ca.gov/marine/divingsafety.asp for more information about CDFW's Diving Safety Program.*

Dungeness Crab – Staff successfully implemented the first season of the commercial Dungeness crab trap limit program. *Visit the Marine Region website at www.dfg.ca.gov/marine/invertebrate/regulations_com.asp for more information about CDFW's commercial Dungeness crab program.*

Green Sturgeon – Staff and partners planned an ongoing, collaborative study to satellite tag and monitor the survival of any incidentally caught green sturgeon in the central California trawl fishery. Field work was planned for the next two years. *Visit the Marine Region website at www.dfg.ca.gov/fish/Resources/Sturgeon/ for more information about green sturgeon.*

Hagfish – Staff completed a trap study, funded by Collaborative Fisheries Research West, that investigated the relationship between trap hole diameter and the size and maturity of hagfish sampled in Monterey Bay. Using this information, staff implemented a regulation change in the commercial hagfish fishery which established a minimum hole diameter in hagfish traps.

Staff tested alternative gear for hagfish by working with an experimental gear permittee to investigate the feasibility of using 40-gallon barrel traps in the commercial hagfish fishery. *Visit the Marine Region website at www.dfg.ca.gov/marine/sfmp/index.asp for more information about hagfish.*

Herring – Staff have continued work to incorporate the 2012 Fish and Game Commission Forage Policy into fishery management and has continued to build a collaborative, stakeholder-driven process that is designed to produce a fishery management plan for herring. *Visit the Marine Region website at www.dfg.ca.gov/marine/herring/index. asp for more information about herring.*

Night smelt – Staff completed the first year of a collaborative study to investigate the life history of night smelt in northern California in collaboration with Humboldt State University, H.T. Harvey and Associates, and the California Beach Fishermen's Association. *Visit the Marine Region website at www.dfg.ca.gov/marine/sfmp/truesmelts.asp for more information about night smelt.*

Red Sea Urchin – Staff worked closely with the California Sea Urchin Commission and commercial sea urchin buyers to explore common ground regarding reduction of the number of permits in the fishery, ways to provide for a more orderly and sustainable fishery, and refinement of related regulations. If industry support coalesces, staff will develop a rulemaking proposal in 2015. Visit the Marine Region website at *www.dfg.ca.gov/marine/invertebrate/seaurchin.asp* for more information about sea urchin.

Biologists Travis Buck (L) and Carlos Mireles (R) work up sea cucumber samples
CDFW photo by D. Stein

Rock Crab – Staff reviewed changes in the fishery that resulted from a regulation change in 2010 that allowed the transfer of commercial permits. Staff will present review findings to the Fish and Game Commission in 2015 and use them to inform adaptive management. *Visit the Marine Region website at www.dfg.ca.gov/marine/invertebrate/crabs.asp for more information about rock crab.*

Sea Cucumber – Thirty-two collection dives, mostly at the northern Channel

Islands, produced 617 sea cucumbers that were dissected for biological analysis. Staff also completed 32 survey transects (~80 individual dives) to measure sea cucumber density. During these transects, divers covered 3,200 square meters and measured 1,043 cucumbers. Staff also began a new study to identify the spawning season and size at first reproduction for sea cucumbers in southern California. *Visit the Marine Region website at www.dfg.ca.gov/marine/invertebrate/tidal.asp for more information about sea cucumber.*

Measuring barred surfperch
CDFW photo

Spiny Lobster – After completing a two-year Lobster Advisory Committee process involving fisheries representatives and members of the public, project staff finished the preliminary draft of the Lobster Fishery Management Plan. The plan has been submitted to the California Ocean Science Trust for independent, scientific peer review. A final draft of the Lobster Fishery Management Plan, along with implementing regulations, will be submitted to the Fish and Game Commission for adoption in 2015. *Visit the Marine Region website at www.dfg.ca.gov/marine/lobsterfmp/ for more information about the California Spiny Lobster Fishery Management Plan process.*

Surfperch – Staff continue to gather data for a long-term database on life history and age/length distributions of surfperch species in central California, and a similar database was started in northern California. Both databases will be used in support of fishery management. Staff also continued to record the sex of surfperch sampled by the California Recreational Fisheries Survey using a non-invasive method developed by staff, to inform future stock assessments. Staff also completed the first year of a collaborative study on redtail surfperch found in and adjacent to marine protected areas in northern California. *Visit the Marine Region website at www.dfg.ca.gov/marine/sfmp/index.asp for more information about surfperch.*

White Seabass Enhancement – The culmination of 30 years of research and collaboration between CDFW, contractors, and volunteers resulted in the 2 millionth white seabass release into the wild from the marine finfish hatchery in Carlsbad, CA. With this significant milestone, CDFW has begun a comprehensive evaluation of the White Seabass Experimental Enhancement Program to determine if the program has been a successful and cost-effective tool for white seabass enhancement and management. *Visit the CDFW website at www.dfg.ca.gov/marine/abmp/orehp.asp for more information about white seabass enhancement activities.*

2. State-Federal Marine Species Program

This program is responsible for fisheries jointly managed by state and federal entities.

California harvests of sardine, mackerel, anchovy, Klamath-zone salmon, squid, and bluefin tuna all remained within specified limits in 2014, due to the collaborative efforts between CDFW, federal partners, and the commercial fishing industry. CDFW actively monitored harvest in each of these fisheries during the open season.

With minor exception, California's sport and commercial groundfish fisheries (which include over 90 species of rockfish, roundfish, flatfish, skates, and sharks) all remained within prescribed annual catch limits and accountability measures in 2014 due to active monitoring and management by CDFW, partner agencies, and stakeholders.

Bluefin Tuna – Staff analyzed fishery logbook records for bluefin tuna, which was recently declared overfished, and recommended a reduction in the recreational fishery bag limit from 10 fish to 2 fish per person, per day. The recommendation, which was ultimately supported by industry, is expected to be implemented in federal law in 2015. CDFW and partners developed a plan that permits continued filleting of tuna at sea, while preserving the ability to differentiate between bluefin tuna and other species of tuna.

CDFW, as a member of the U.S. delegation to the 24-nation Inter-American Tropical Tuna Commission, helped to develop a resolution calling for reductions in commercial bluefin tuna harvest across the Eastern Pacific Ocean. *Visit the CDFW website at www.dfg.ca.gov/marine/cpshms/tunas.asp for more information about bluefin tuna.*

Coastal Pelagic Species – With assistance from federal scientists and input from non-governmental organizations and the commercial fishing industry, staff participated in policy review and the selection of a revised Pacific sardine fishery harvest rate. Staff evaluated and used stock status information on Pacific sardine and mackerel to develop its recommendation for 2014 West Coast fishery harvest levels in collaboration with other state and federal agency representatives.

Staff determined the ages of Pacific sardine and mackerel taken in the fisheries for use in annual stock assessments. In 2014, 1,450 pairs of sardine and 1,250 pairs of mackerel otoliths were used to determine age.

CDFW aerial surveys continued, in collaboration with the California Wetfish Producers Association, to record fish school biomass and develop biomass estimates for sardine, anchovy, and mackerel in Southern California. Additionally, CDFW held a workshop with the National Marine Fisheries Service to review and improve survey methods.

Staff participated in the Tri-national Sardine Forum, an annual meeting of scientists from Canada, the U.S., and Mexico, to review current research on West Coast sardines. This year, the forum was held in Mexico and CDFW contributed a presentation that was given by National Marine Fisheries Service partners

Biologist Kirk Lynn scans the sea surface for sardine schools from a small airplane *CDFW file photo*

Staff used new, more efficient methods to track coastal pelagic species' quotas, and were better able to provide weekly squid landing updates to the public on the Marine Region website. Staff visited the docks 12 days per month at more than six different ports to digitally enter catch information and track the quotas for squid, sardine, anchovy, Pacific mack-erel, and jack mackerel. Staff also took biological samples of these species to use in annual stock assessments. *Visit the CDFW website at www.dfg. ca.gov/marine/cpshms/index.asp for more informa-tion about coastal pelagic species.*

Ecosystem – Staff responded to requests for increased protections on unmanaged forage fish in federal waters by working with partners to support a prohibition on development of new fisheries on a comprehensive suite of forage fish.

In collaboration with federal agency partners, staff assisted with updating the Federal List of Fisheries to include all existing federal- and state-managed fisheries that occur in federal waters, and prohibit the initiation of new commercial fisheries in federal waters using trawl gear or nets without prior consultation with the federal agency partners.

Healthy black-and-yellow rockfish *CDFW file photo*

Groundfish – Fourteen years after a federal groundfish disaster was declared, 21 species of groundfish were recognized as sustainable and upgraded from "avoid" to either "Best Choice" or "Good Alternative" on the Monterey Bay Aquarium Seafood Watch list. This achievement made national news and was a result of regulations that restrict fishing, which were implemented by CDFW and partners.

In response to requests from a variety of partners and the public, staff developed a regulatory framework to allow for the use of electronic monitoring (i.e. video cameras) in lieu of the mandatory 100 percent human observer requirement in the groundfish catch share program. Electronic monitoring is expected to reduce operating costs for some of the fleet while still achieving overall program monitoring goals.

Rebuilding of overfished groundfish stocks such as bocaccio and cowcod proceeded more quickly than projected, possibly in response to management and outreach efforts by staff and partners to avoid and care for these species of concern. Descending devices can improve survival when fish are released; CDFW and partners have all promoted use and widespread distribution of these devices.

In collaboration with federal agency partners and commercial groundfish fishermen, staff assisted with developing terms and bycatch limits for an experimental commercial mid-water longline fishery on yellowtail rockfish, with the goal of minimizing take of overfished species that are bottom-oriented (i.e., canary and yelloweye rockfish).

In partnership with the International Pacific Halibut Commission, staff collected rockfish bycatch information during the West Coast Pacific halibut survey in the summer of 2014. This information will help to determine the stock status for overfished species, including yelloweye rockfish, in future assessments. *Visit the CDFW website at www.dfg.ca.gov/marine/groundfishcentral/index.asp for more information about groundfish.*

Market Squid – In collaboration with the California Wetfish Producers Association, staff actively monitored and managed squid fishery performance. In close coordination with staff, the commercial fishing industry regulated itself to attain, but not exceed, the seasonal catch limit and pursued a goal of sharing catch between fishery sectors.

Staff processed over 600 market squid mantle punches to monitor the long-term sustainability of the squid fishery. Staff closed a regulatory loophole for the market squid fishery that permitted fishing even though the fishery was closed. *Visit the CDFW website at www.dfg.ca.gov/marine/cpshms/marketsquid.asp for more information about market squid.*

Pacific Halibut – California's recreational Pacific halibut allocation will increase from 1 percent to 4 percent of the West Coast's non-tribal catch in 2015. This is the direct result of staff-led, collaborative efforts between North Coast community fishing groups and government agencies to evaluate allocations in the West Coast Catch Sharing Plan. Staff conducted two open meetings and a teleconference to discuss Pacific halibut management development, which were attended by about 50 individuals.

Staff developed a monitoring and management plan for the recreational Pacific halibut fishery that calls for

in-season fishery monitoring and weekly catch reporting. The plan will be implemented in 2015.

California will send a delegation to the International Pacific Halibut Commission for the first time ever in January 2015. *Visit the CDFW website at www.dfg.ca.gov/marine/pacifichalibut.asp for more information about Pacific halibut.*

Sablefish – In collaboration with federal agency partners, staff examined alternatives for real-time monitoring of sablefish (black cod) landings to ensure that harvest stays within allowable limits. Requiring electronic fish tickets for all sablefish landings was ultimately chosen as the best alternative to meet this objective. A final rule is expected to go into effect in early 2016. *Visit the CDFW website at www.dfg.ca.gov/marine/groundfishcentral/ for more information about sablefish.*

Salmon – Staff and partner agencies determined the origin and age of approximately 45,000 salmon taken in 2014 sport and commercial salmon fisheries. Almost all of these fish were produced, raised and released from California hatcheries located throughout the state.

Staff responded to approximately 350 public inquiries received through the Ocean Salmon Courtesy Request Program. On request, the program sends information to commercial trollers and recreational anglers about the salmon they landed. Coded-wire tags extracted from the head of the fish provide the hatchery of origin, brood year, stock, run type, release date, and location.

Heidi Lovig from the California Recreational Fisheries Survey measuring a Pacific halibut *CDFW file photo*

Staff reviewed and evaluated a suite of alternative control rules for California ocean salmon fisheries proposed by the National Marine Fisheries Service for federally-endangered Sacramento River winter-run Chinook salmon. CDFW supported several control rules that provided adequate protection to the stock while still allowing limited fishing opportunities on other stocks during low winter-run abundance levels.

In conjunction with federal agency partners, staff examined methods to better assess and monitor populations of Endangered Species Act-listed California coastal Chinook, with a goal of finding new alternatives to ensure continued protections while minimizing impacts to sport and commercial fisheries.

In response to a request from the angling community, staff developed a coho salmon education and outreach program for the recreational ocean salmon fishery. Field staff provided information on coho salmon identification and proper release techniques to reduce fishery impacts on this Endangered Species Act-listed stock, contacting roughly 500 anglers during the 2014 season.

In response to requests from recreational fishery groups, staff worked to change the salmon possession limit from two fish to four fish.

During the annual salmon meeting, which attracted over 100 interested stakeholders, staff provided information on 2013 ocean salmon fisheries, spawning escapement, and the outlook for 2014 sport and commercial ocean salmon fisheries. Members of the public provided input to a panel of California salmon scientists, managers, and representatives for consideration in the development of the 2014 ocean salmon regulations.

Klamath River Technical Team collaboration continued with tribes, federal agencies and other state programs to consolidate and summarize catch and other survey information on Klamath River fall Chinook for use in the 2014 management cycle.

In collaboration with partner agencies, staff continued to implement the Central Valley Scale Age Project. The goal of this project is to improve management of Sacramento River fall Chinook, which supports approximately

Staff records information about recreationally caught salmon
CDFW file photo

90 percent of California's ocean and river salmon fisheries. *Visit the CDFW website at www.dfg.ca.gov/marine/oceansalmon.asp for more information about ocean salmon.*

Swordfish – Responding to requests from both non-governmental organizations and the commercial fishing community, staff, and other agencies and partners examined prospective fishing gears to effectively harvest swordfish off the West Coast, including harpoon, buoy gear, and longline gear, with a goal of reducing bycatch from current levels observed in the drift gillnet fishery. This analysis is expected to result in the issuance of experimental fishery permits in 2015. *Visit the CDFW website at www.dfg.ca.gov/marine/cpshms/billfishes.asp for more information about swordfish.*

White Shark – Staff worked with partners to support enhanced fishery data collection programs that will evaluate white shark population trends off California. *Visit the CDFW website at www.dfg.ca.gov/marine/cpshms/sharks.asp for more information about white shark.*

3. Resource Assessment Program

California Recreational Fisheries Survey (CRFS) – Staff continued to provide marine recreational fish catch and effort estimates used by state and federal fisheries agencies to manage California's fisheries. CRFS staff contacted over 68,000 angling parties targeting fish in state marine waters. Anglers reported catching over 545,000 fish and staff was able to observe and identify over 245,000 fish and invertebrates to species. In addition, staff measured over 132,000 fish. CRFS and CDFW's Ocean Salmon Project staff together recovered 5,776 salmon heads from the ocean salmon recreational fishery. In a joint effort between CRFS staff and statistical consultants from the federal Marine Recreational Information Program, some CRFS survey and estimation methods were redesigned and improved. *Visit the CDFW website at www.dfg.ca.gov/marine/crfs.asp for more information about CRFS.*

Improving Data Systems – Staff continued implementation of key fisheries-dependent data systems to ensure secure, centralized, and easily accessible data. When completed, the systems will facilitate the use of near real-time data in management and is expected to improve data quality and reduce costs for CDFW.

Marine Log System: Commercial Passenger Fishing Vessel Logs – In 2013, the Marine Region and Data and Technology Division began development of the Marine Log System to consolidate and secure all the commercial fisheries logbook data in one central database and allow for web-based data entry by licensed commercial fishermen. The Commercial Passenger Fishing Vessel log, the first web-based system, was developed in 2014 and will be tested by licensed commercial fishermen in early 2015.

Recreational Fisheries Data System – Marine Region and Data and Technology Division staff developed and maintained a data system for California Recreational Fisheries Survey catch, effort, biological and spatial data, and estimates. The data and software system includes a centralized relational database to store information, a data entry system with built-in error checks, validation routines to improve data accuracy, and data and estimation reports. The data system increased efficiency, improved data accuracy, and provided the flexibility to align data capture with changing management needs.

Staff and partners used the survey data and estimates for management, including in-season monitoring for species of concern, harvest guidelines, stock assessments, regulatory analyses, project siting, and other critical management decisions. *Visit the CDFW website at www.dfg.ca.gov/marine/recfishingdata/index.asp# for more information about recreational fishing data.*

Marine Fisheries Statistical Unit – Data from approximately 34,000 commercial passenger fishing vessel logs were entered by staff in 2014. The number of landing receipts received near the end of 2014 was on track with previous years, and CDFW expects to have entered data for approximately 65,000 receipts for 2014. Staff produced the 2013 California commercial landings report, which was posted to the CDFW website. Landing receipt books and various logbooks were distributed to constituents throughout the state. *The California commercial landings report can be accessed online at www.dfg.ca.gov/marine/fishing.asp.*

Scott Benson, a California Recreational Fisheries Survey sampler, takes the head from an adiposefin-clipped salmon landed in Shelter Cove *CDFW photo by E. W. Roberts III*

Pacific Recreational Fisheries Information Network (RecFIN) – Staff supported RecFIN efforts to coordinate with partners on the collection of marine recreational finfish data and procedures for estimating catch, effort, and participation. Staff represented California on the RecFIN's Technical Committee and chaired the Statistical Subcommittee.

Staff determine the sex of California halibut using ultrasound.
photo courtesy L. Flynn

Southern California Fisheries Research – Staff completed significant research, monitoring, and analyses to fill data gaps in life history information for kelp bass and barred sand bass. Staff collected information on over 3,500 bass, including the mortality rate of released fish, discard rates, and lengths of fishes caught and released, to evaluate the effectiveness of recent regulatory changes and to inform adaptive management.

In collaboration with the Santa Monica Bay Restoration Foundation, staff completed research that demonstrated the effectiveness of using a portable ultrasound machine to determine the sex of live California halibut. This method allows quick and accurate sex determination without harming the fish. *Visit the CDFW website at www.dfg.ca.gov/marine/scfrmp/ for more information about Southern California fisheries research.*

Statistical and Technical Support – Staff provided statistical and technical support related to the management and restoration of fish stocks. Support provided for various projects included: analyses of Pacific halibut effort data; summaries and analyses of bluefin tuna data; advice on use of CRFS data and estimates; review of a number of publications that used CRFS data and estimates; GIS analyses of CRFS spatial data for aquaculture project siting; regulatory analyses and stock assessments; advice on integrating marine protected areas into fisheries management, and guidance to the team working on the new CPFV log system. *Visit the CDFW website at www.dfg.ca.gov/marine/recfishingdata/index.asp for more information about statistical and technical support for management and restoration of fish stocks.*

4. Habitat Conservation Program

Advisory Groups – Staff represented West Coast fishery managers on the California Current Acidification Network steering committee and provided input on the informational needs of state managers regarding ocean acidification. Staff also participated on the Southern California and Central California Coastal Ocean Observing System Joint Strategic Advisory Committee and the Resources Agency Sea Grant Advisory Panel.

Agreements for Sharing Confidential Data – Eight non-disclosure agreements were developed that allow non-government fishery and socioeconomics scientists to incorporate confidential state fisheries data into their project analyses. In addition, staff continued to provide confidential data to NOAA Fisheries scientists for use in the management of West Coast fisheries by the Pacific Fishery Management Council.

Climate College – Staff assisted CDFW's Climate College coordinator with development of the 2014 Climate College, which focused on climate change impacts to California's coastal ocean waters and ecosystems. This assistance included providing input on potential class topics and speakers, facilitating discussion periods during the classes, and presenting information during the final class on ways climate change is being integrated into the marine section of the updated State Wildlife Action Plan. *Visit the CDFW website at www.dfg.ca.gov/Climate_and_Energy/Climate_Change/Climate_College/ for more information about the Climate College.*

Environmental Review – Staff worked on a wide variety of projects, permits, and statewide plans. Staff participated in over 50 pre-project review meetings and reviewed over 500 environmental documents (plans, surveys, reports, permits, public notices, CEQA, CESA, etc.). Staff also reviewed over 50 CEQA documents, 100 U.S. Army Corps of Engineers Public Notices, 100 monitoring reports, 40 invasive species survey reports, and 35 permits from various agencies. Topics reviewed included: wave energy, desalination plant impacts, power plant impacts, dredging impacts, beach nourishment projects, contaminant site remediation, mitigation projects, CESA impacts, tribal concerns, State Water Resources Control Board Policy Review, and dock and pier construction impacts. In addition, staff participated in the review and development of several U.S. Navy and U.S. Air Force Integrated Natural Resource Management Plans. *Visit the CDFW website at www.wildlife.ca.gov/Conservation/Environmental-Review for more information about statewide environmental review.*

Environmental Review Coordination and Collaboration – Staff worked closely with other agencies, applicants, and CDFW regions to coordinate environmental review activities. Some activities included:

- Surveying eelgrass in the Albion River watershed with the Region 1 Timber Program and the Marine Region's Aquaculture and Bay Management Project, and assisting with a timber harvest plan review
- Gathering all known longfin smelt data for areas north of San Francisco, and developing a draft manuscript for 2015
- Participating in multiple interagency meetings on the proposed Broad Beach Shoreline Protection and Dune Restoration Project in Malibu
- Helping to develop a statewide policy for desalination plant impacts as part of the State Board's Interagency Panel Participating on the Interagency Panel dealing with the Diablo Canyon Nuclear Power Plant. This included oral testimony to the California State Water Resources Control Board.

Kelp forests provide habitat for a variety of fish and invertebrates *CDFW photo*

- Helping to develop a comprehensive eelgrass management plan proposed by the City of Newport Beach for lower Newport Bay
- Participating on the CDFW Mitigation Banking Team
- Addressing sand mining, dredging and oyster shell harvesting impacts in San Francisco Bay as part of the San Francisco Bay Conservation and Development Commission
- Collaborating with representatives from academia to develop beach nourishment impact assessment tools for grunion, beach wrack, and Pismo clams
- Participating on the Statewide and Regional Coastal Sediment Management teams
- Participating on the Los Angeles Dredge Material Management Team

CDFW staff and partners conduct remotely operated vehicle studies to monitor MPAs
photo courtesy M. Prall

Visit the CDFW website at www.wildlife.ca.gov/Conservation/Environmental-Review for information about statewide environmental review.

Kelp Management – Staff completed an aerial survey of the kelp canopy along the entire mainland coast and Channel Islands. Staff amended the "Informational Digest to the Regulations Governing the Harvest of Kelp and other Marine Algae in California" and revised/updated maps depicting administrative kelp beds and edible seaweed maps. This document is designed to provide up-to-date information for commercial harvesters of kelp and other marine algae. A new "Kelp and Other Marine Algae" page that contains maps, information, and regulations governing the commercial harvest of algae was added to the Marine Region website. *Visit the CDFW website at www.dfg.ca.gov/marine/kelp.asp for more information about kelp management.*

Marine Protected Area (MPA) Monitoring – Staff successfully coordinated and collaborated with key partners to provide oversight on all aspects of MPA monitoring to inform adaptive management of the largest scientifically designed network of MPAs in North America. Accomplishments in 2014 include producing a summary report in February that highlighted results from the North Central Coast MPA Baseline Monitoring Program, launching the North Coast MPA Baseline Monitoring Program in April, completing the Central Coast MPA Monitoring Plan, which was approved by the Fish and Game Commission in October, and convening a peer-review panel to improve technical reports from the South Coast MPA Baseline Monitoring Program. *Visit the CDFW website at www.dfg.ca.gov/marine/mpa/monitoring.asp for more information about California MPA monitoring.*

Marine Protected Area (MPA) Outreach – Staff continued to keep the public informed about MPAs using: MarineBIOS, an interactive marine spatial planning web map; GIS data, static maps, web-based maps, the California MPA website, a variety of printed materials, and the MPA mobile website. Staff developed materials including posters, flyers, information cards, guides, and brochures.

When MPA regulation changes went into effect October 1, 2014 all four of the regional MPA guidebooks were updated by staff, using stickers that explained the regulation changes. With help from the Natural Resources Volunteer Program, staff updated 4,700 guidebooks. Online guidebooks and brochures were also updated. Staff distributed 28,330 guidebooks and 17,176 brochures to businesses, non-profit groups, harbors, and individuals throughout the state.

Staff wrote and article for the July/August 2014 issue of ***Outdoor California*** titled "A Network of Protection: Mystery of the Marine Protected Areas Explained". Staff also developed site-specific MPA overview sheets for Northern and North Central California to provide detailed information for all MPAs within those regions.

Staff attended, presented, and participated in all of the first meetings (and in many additional meetings) of the fourteen MPA Community Collaboratives. Staff also attended and gave a presentation at the Statewide MPA Community Collaborative Workshop attended by the MPA Collaborative chairs and agency personnel.

Staff continued to work with State Parks to develop MPA-related content for three distance-learning programs at Pyramid Point, Año Nuevo, and Crystal Cove. MPA programs will debut Winter-Spring 2015 and are projected to reach approximately 8,000 students throughout the state.

A pilot MPA and Fishery Informational Kiosk in San Mateo County at Pillar Point Harbor was completed in collaboration with the Marin MPA Community Collaborative and the Pillar Point Harbor District. This project will serve as a template for cooperative kiosk design and installation in other harbors statewide.

Staff reviewed MPA outreach materials produced by partners, including brochures, signs, interpretive panels, online tools, and docent guides. Staff continues to work with partners on a statewide MPA signage project for the placement of interpretive signs in major ports statewide. *Visit the CDFW website at www.dfg.ca.gov/marine/mpa/ for more information about California MPA outreach*.

Marine Protected Area-Marine Life Management Act Integration – Staff convened an internal two-day workshop in May to discuss how California's network of marine protected areas (MPAs) can be incorporated into fisheries management. Staff reviewed the results from a 2011 Marine Region workshop on this topic, presented results from current staff efforts to use MPAs in the management of specific nearshore fisheries, and considered staff needs for additional information and guidance that would assist with integrating the MPA network into fisheries management. One important recommendation generated from this workshop was to hold a joint workshop with fishermen so that their valuable perspectives can be incorporated into the effort. Staff also worked with the California Ocean Science Trust's MPA Monitoring Enterprise to update the "Integrating Fisheries Monitoring and MPA Monitoring" appendix for the Central Coast MPA Monitoring Plan. *The Marine Life Management Act is available on the CDFW website at www.dfg.ca.gov/marine/mlma.*

Marine protected area outreach

Partnership Coordination – Staff continues to work in partnership with partners to assess baseline ecological and socioeconomic conditions of California's marine protected area network on a regional basis, develop cost effective long-term monitoring plans, and conduct regional cyclic monitoring reviews and assessments.

Staff were integral to the development of the "The California Collaborative Approach: Marine Protected Areas Partnership Plan" adopted by the Ocean Protection Council and endorsed by the Fish and Game Commission. This plan outlines a partnership approach to managing California's network of marine protected areas among state agencies, California tribes and tribal governments, fishermen, non-consumptive recreational users, academics, federal and local governments, and non-profit organizations.

Remotely Operated Vehicle (ROV) – Staff deployed ROVs inside and outside of marine protected areas (MPAs) in Southern California, including at the Channel Islands. Staff completed 142 km of transects resulting in close to 100 hours of ROV video and over 14,000 still images. These surveys also employed stereographic video for the first time, which enabled staff to measure the size of fish recorded on video.

Staff also completed ROV deployments at sites on the northern California coast. This deployment was carried out in conjunction with the North Coast MPA Baseline ROV Project. The two complimentary projects completed the largest underwater visual survey of northern California habitats and MPAs to date, visiting many sites that had never been observed. Staff completed over

100 km (60 km CDFW, 40 km MPA Baseline ROV Project) of video transects and collected approximately 9,000 still images. *Visit the CDFW website at www.dfg.ca.gov/marine/mpa/monitoring.asp for more information about remotely operated vehicle projects.*

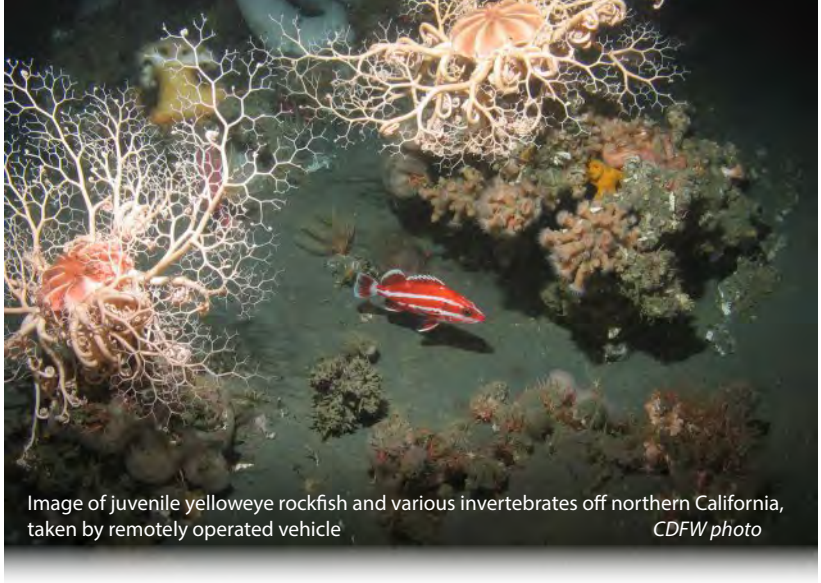

Image of juvenile yelloweye rockfish and various invertebrates off northern California, taken by remotely operated vehicle *CDFW photo*

Scientific Collecting Permit Program – In collaboration with the Ocean Protection Council's Science Advisory Team, staff led development of a progressive approach to objectively understand and estimate ecological impacts from scientific collecting in marine protected areas. This effort is part of an overall effort to improve how research and education is managed via the CDFW's Scientific Collecting Permit Program. *Visit the CDFW website at www.dfg.ca.gov/marine/mpa/scientificcollecting.asp for more information about permits for scientific collecting within marine protected areas.*

State Wildlife Action Plan Update – Staff assisted in updating the State Wildlife Action Plan by providing input during technical team meetings, leading conservation unit team meetings, providing expertise in the development of target strategies and goals, and presenting draft results at public meetings. Staff also assisted in the development of strategies and goals for the San Francisco Bay-Delta conservation unit target (salt marsh). *Visit the CDFW website at www.dfg.ca.gov/swap/ for more information about the State Wildlife Action Plan.*

5. Administration

Staff restructured the Marine Region procurement function to increase efficiency, accountability, and support for scientific staff.

Staff also changed the Request for Personnel Action process to ensure complete and accurate submittals.

Finally, staff completed a full, region-wide inventory reconciliation, and implemented changes to the temporary help tracking system to increase transparency and ease of budget tracking.

For more information about Marine Region projects, please visit www.dfg.ca.gov/marine
or email AskMarine@wildlife.ca.gov